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Response to Office Action dated December 22, 2006

REMARKS

In the Office Action dated December 22, 2006, the Examiner rejects claims 5 and 7 under 35 U.S.C. § 112, second paragraph, and rejects claims 1 - 7 under 35 U.S.C. § 103(a). With this Amendment, Applicant amends claims 1 and 3-7. Claims 7-19 are added, and no claims are canceled. After entry of this Amendment, claims 1-19 are pending in the Application. Reconsideration of the Application as amended is respectfully requested.

Applicant initially notes that a number of typographical and/or grammatical changes have been made to the specification and to the Abstract. Applicant submits that these changes are supported by the specification, claims and/or drawing figures and add no new matter to the Application as filed. Applicant respectfully requests entry of these changes in the Application.

Applicant further notes that a number of changes have been made to the claims as previously presented. In claims 5-7, duplicative, confusing language in the preamble has been removed for clarity. In claim 1, the word "preset" has been removed from the preliminary reference value and the limit reference value to clarify antecedent basis. In claims 1 and 7, the description associated with the alarm output section and the calculation control section, respectively, has been amended to more closely conform to U.S. claiming practices. In claim 7, antecedent basis for each of the length and the angle of the boom has been corrected. Other changes to the claims are described hereinafter.

The Examiner first rejects claims 5 and 7 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. The Examiner states that the preliminary reference value and the limit reference value added in claim 5 are either redundant recitations of the reference values and limit reference values of claim 1, or they are additional values for which there is no explanation as to how these new values are correlated to form an operative device. Applicant has amended claim 5 to indicate clarify antecedent basis in that claim 5 refers to the preliminary reference value and the limit reference value of claim 1. Applicant respectfully submits, however, that these are not redundant recitations of

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the elements of claim 1. Instead, claim 5 recites setting switching means for enabling the preliminary reference value and the limit reference value to be switched and set in accordance with an overhang distance of each outrigger. Applicant respectfully submits that claim 5 is clear and definite and meets the requirements of 35 U.S.C. § 112, second paragraph.

The Examiner further states that claim 7 adds a detected value that appears to be a redundant recitation. Applicant has carefully reviewed claim 7 and clarified antecedent basis for the various values mentioned therein. Applicant respectfully submits that claim 7 is also clear and definite and meets the requirements of 35 U.S.C. § 112, second paragraph.

Based on the foregoing, Applicant respectfully requests withdrawal of the Examiner's rejections based on 35 U.S.C. § 112, second paragraph.

The Examiner rejects claims 1 and 4 under 35 U.S.C. § 103(a) as being unpatentable over Bucholz (US 3,713,129) in view of Hoffelmeyer et al. (US 6,735,486). The Examiner states that Bucholz teaches all the features of claim 1 except that Bucholz fails to teach or suggest a second alarm for a second value. The Examiner further states that Hoffelmeyer et al. shows a similar crane safety device that has first and second pre-established load limiting values for communicating first and second alarms to the operator. Finally, the Examiner states that it would have been obvious to one skilled in the art at the time the invention was made to modify the safety device of Bucholz by establishing two reference values so as to have two warning signals communicated to the operator for indicating an early approach of a tipping condition as well as a more dangerous near tipping condition. To make this argument, the Examiner gives no patentable weight to the "crawler crane" of claim 1.

Applicant has amended claim 1 to provide additional description of the features of the crawler crane, which also provides antecedent basis for the terms later used in claims 3 and 4, which are amended accordingly. Applicant has also amended claim 1 to provide additional description of each of the preliminary reference value and the limit reference value. The preliminary reference value represents a preliminary alarm state prior to the crane reaching a stability limitation, and the limit reference value represents a need to stop the crane so that the crane

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reaches the stability limitation in its maximum overhang state or in its minimum overhang state.

It is respectfully submitted that the Examiner has failed to make a *prima facie* case of obviousness of claim 1 and its dependent claims, including claim 4. First, the Examiner has mischaracterized the teachings of Bucholz. Bucholz teaches a crane safety device based on the adoption of the calculations of four summing comparators. Each of the summing comparators compares a respective sum to a single loading limit, that is, a set level. (Col. 3, ll. 36-39). If a respective sum is above the set level, a binary 0 is sent from that summing comparator to the OR gate 26. (Col. 3, ll. 44-46). In any of the respective sums falls below the set level, a binary 1 is sent from that summary comparator to the OR gate 26. (Col. 3, ll. 46-49). The OR gate 26 then sends a signal to turn on an alarm.

In contrast, claim 1 sums calculations $(A+B)$, $(C+D)$, $(A+C)$, $(B+D)$ on every two adjacent outriggers. Then, the minimum value of these sums $(A+B)$, $(C+D)$, $(A+C)$, $(B+D)$ is used in comparison with two values, the preliminary reference value and the limit reference value. Accordingly, Bucholz fails to teach or suggest comparing the minimum value of the sums for comparison with two values.

Applicant further submits that this would not be an obvious modification to Bucholz. Bucholz uses summing comparators and a single OR gate to provide a signal to activate an alarm. Since the output of the summing comparators is always a binary signal, either binary 1 or binary 0, instead of a minimum value such as claimed in claim 1 of the invention, there is no motivation, teaching or suggestion to use the binary signal in another comparison.

Hoffelmeyer et al. teaches the pressure sensors using difference pressure between two ports of a rotation motor. However, this reference does not teach or suggest the features of claim 1 of comparing the minimum value of the sums $(A+B)$, $(C+D)$, $(A+C)$, $(B+D)$ on every two adjacent outriggers of crawler crane to two values. Further, neither reference teaches or suggests a device in which an alarm signal can be signaled at a first step and a stop signal for the crane can be signaled at a second step. That is, neither reference provides motivation for making the combination proposed because any such combination would not word with Bucholz

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without a complete redesign, and in any case, the combination fails to teach or suggest using a minimum value of the sums for comparison with a preliminary reference value that represents a preliminary alarm state prior to the crane reaching a stability limitation and a limit reference value that represents a need to stop the crane so that the crane reaches the stability limitation in its maximum overhang state or in its minimum overhang state to output a preliminary alarm signal when the minimum value is smaller than the preliminary reference value or output a limit alarm signal when the minimum value is smaller than the limit reference value. The invention compares the minimum value and preliminary reference value or limit reference value that can notify the preliminary alarm state at a first step and operate a stop state of the crane at a second step. The cited references, taken either singly or in any permissible combination, fail to teach or suggest the features of claim 1 and its dependent claims.

Applicant further objects to the Examiner's failure to consider the feature of the crawling crane when determining the patentability of the claims. Here, the preamble of the claims provides antecedent basis for elements within the body of the claim. To make this more clear, the elements of the crawling crane that provide antecedent basis for the elements in dependent claims, such as claim 4, among others, are added to claim 1. It is respectfully submitted that claim 1 and its dependent claims, including claim 4, are also allowable in that neither Bucholz nor Hoffelmeyer et al. is directed to a crawling crane.

The Examiner rejects claim 2 under 35 U.S.C. § 103(a) as being unpatentable over Bucholz in view of Hoffelmeyer et al. and further in view of JP 3-25495, Axakov et al. or Karpa. The Examiner states that Bucholz as modified by Hoffelmeyer et al. teaches the features of claim 2 except for the load cell including a conical disk spring, which the Examiner states is well known as shown with reference to the other citations. Applicant respectfully submits that none of the references, taken in any permissible combination, fails to cure the deficiencies in claim 1 described above. Therefore, claim 2 is allowable based on its dependency from allowable claim 1.

The Examiner rejects claims 3 and 5-7 under 35 U.S.C. § 103(a) as

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being unpatentable over Bucholz in view of Hoffelmeyer et al. and further in view of Hayashi et al. The Examiner states that the combination of Bucholz and Hoffelmeyer et al. teaches all the features of claim 1 as previously discussed. With respect to claims 3, 5 and 7, the Examiner states that it would have been obvious to modify the combination to include the features of Hayashi et al. of an extendable boom and extendable outriggers with a boom length sensor 11 and outrigger length sensors 14 for a calculating and controlling unit 20 to increase the reach of the crane of Bucholz and to be able to adjust the outriggers of Bucholz as taught by Hayashi et al. With respect to claim 6, the Examiner states it would have been obvious to include an on/offset switch in the combination.

Applicant respectfully submits that the Examiner is engaging in impermissible hindsight in an attempt to deprecate the claimed invention. There is no motivation to incorporate such features into Bucholz as Bucholz is directed to a crane with outriggers of a fixed, uniform length, not a crawling crane. Bucholz would not work with outriggers not having a fixed, uniform length. Moreover, the Examiner has broadly cited features of Hayashi et al. without acknowledging that Hayashi et al. fails to teach or suggest the claimed feature of claim 3 wherein the load detector is provided at a base end of the outrigger cylinder, the claimed feature of claim 5 of setting switching means for enabling the preliminary reference value and the limit reference value to be switched and set in accordance with an overhang distance of each outrigger and the claimed feature of claim 7 of the a damage preventing device, which includes other limitations not shown in Hayashi et al. Applicant similarly submits that claim 6 does not include an "on/off switch," but instead includes operation switching means for switching the safety device between an inoperative mode and an operative mode depending on whether the crawler crane is in a traveling mode or in a crane mode.

Finally, Applicant respectfully submits that Hayashi et al. fails to cure the deficiencies in the combination of Bucholz and Hoffelmeyer et al. That is, the combination of Hayashi et al. Bucholz and Hoffelmeyer et al. also fails to teach or suggest all the features of claim 1 as previously described. Hence, each of claims 3 and 5-7 is patentable over the prior art of record for the features cited therein and

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based on dependency from claim 1.

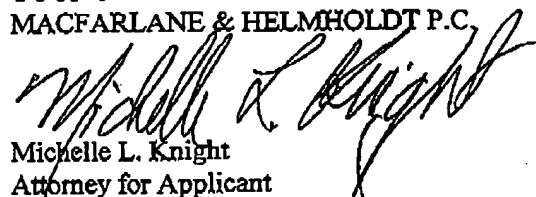
Applicant has added new claims 7-19 to claim different inventive combinations of the elements described in the specification and claims. Each of claims 1-15 depends from claim 1 and hence is patentable over each of the cited references for the reasons stated herein. Independent claim 16 and its dependent claims 17-19 are written in Jepson form and are directed to an improvement to a crawling crane. It is respectfully submitted that claims 16-19 are novel and non-obvious and are allowable over the prior art of record. Examination and allowance of claims 7-19 are respectfully requested.

It is submitted that this Amendment has antecedent basis in the application as originally filed, including the specification, claims and drawings, and that this Amendment does not add any new subject matter to the application. Consideration of the application as amended is requested. It is submitted that this Amendment places the application in suitable condition for allowance; notice of which is requested.

If the Examiner feels that prosecution of the present application can be expedited by way of an Examiner's Amendment, the Examiner is invited to contact Applicant's attorney at the telephone number listed below.

Respectfully submitted,

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Dated: March 22, 2007